

5. SYNGNATHUS GRISEOLINEATUS Ayres.

Syngnathus californiensis *Girard* (nec *Storer*.)Syngnathus abbotti *Girard*.

18 | 9

D. 38—41. Plates $\frac{\quad}{\quad}$.

18 (1) 39—43

San Francisco (1), Dr. Ayres; (1) Dr. Newberry. Tomales Bay (4), Mr. Samuels. Fort Umpqua, Oregon (3), Dr. Vollum.

6. SYNGNATHUS ARUNDINACEUS Girard.

17 | 9

D. 34. Plates $\frac{\quad}{\quad}$.

17 (1) 43

Coast of California (1), Dr. Suckley.

7. SYNGNATHUS LEPTORHYNCHUS Girard.

17 | 8

D. 32. Plates $\frac{\quad}{\quad}$.

17 (1) 41

San Diego, California (1).

8. SYNGNATHUS DIMIDIATUS Gill.

Syngnathus brevirostris *Girard* (nec *Hemp. et Ehr.*, nec *Tem. et Schlegel.*)

17 | 7

D. 30—32. Plates $\frac{\quad}{\quad}$.

17 (1) 37—39

San Diego, California (3).

Subfamily DORYRHAMPHINÆ Kaup.

Genus DORYRHAMPHUS Kaup.

9. DORYRHAMPHUS CALIFORNIENSIS Gill.

The snout forms half the length of the head; its crest is composed of about ten irregular teeth, and farther back are two others. The double frontal crest is well dentated. The superior orbital border has five or six teeth. The ridge under the orbit is unarmed, but on the side of the snout is well serrated. The chin is prominent but unarmed, and some distance behind, in the middle is a slight swelling. The longest superior pectoral rays are about equal to the length of the operculum. The caudal is as long as the snout.

(2 +) 15 | 7

D. 25. A. 3. C. 44. P. 20. Plates $\frac{\quad}{\quad}$.

(1 +) 18 (1) 16

The color is an almost uniform yellowish brown, but with a black streak from the snout to the upper axilla of the pectoral fin.

A single female specimen of this species was discovered by Mr. Xantus at Cape St. Lucas.

Descriptions of New Genera, Subgenera and Species of Tertiary and Recent Shells.

BY T. A. CONRAD.

Family PLEUROTOMIDÆ.

TURRIS, Rumphius. PLEUROTOMA, Lam.

The species of this genus are inhabitants of the Indian Ocean, coasts of Madagascar and China; and, as they are unknown on the American coasts,

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it is probable that all of this family, recent and fossil, in America belong to distinct genera, usually classed as subgenera by authors. The predominant forms in the Miocene of the United States are *Drillia* and *Surcula*, the latter containing some species much larger than any of the former genus. The true *Turris* group is also absent from the Eocene, where species of the two Miocene genera above mentioned and others abound. It is also unknown in a recent state on the American coasts.

SURCULA, Gray.

1. *Surcula engonata*.—Fusiform; whorls 8, turritid, nodulous on the angle, very minute revolving lines above the angle, distinct below it; one line more prominent near and below the suture; labrum margin rounded; body whorl with obsolete revolving lines.

Locality. Virginia.

2. *Surcula nodulifera*.—Subfusiform, turriculate; whorls 8, carinated below the suture by a subtuberculous line, and furnished with tubercles shaped like inverted commas, distant; a revolving line between the tubercles and suture; body whorl with prominent revolving lines and a minute intermediate one.

Locality. Virginia.

3. *Surcula rugata*.—Fusiform, turriculate; whorls 10, lower half obtusely ribbed; upper half concave, subangular, with much curved, rugose lines of growth; beneath the suture whorls obtusely subcarinated, distinct revolving lines over the ribbed portion, minute and obsolete above it; suture profound; body whorl and beak striated; beak slightly curved.

Locality. Calvert Cliffs, Md.

DRILLIA, Gray.

1. *Drillia impressa*.—Elevated, scalariform or turriculate, with short, obtuse ribs; contractions of whorls striated, and having a carinated line near the suture, revolving lines impressed, double, alternated, rugose volutions 8; base subumbilicated.

Locality. James River, Virginia.

2. *Drillia distans*, n. s.—Turriculate, whorls 6, scalariform, with distant obtuse ribs on the lower half; suture waved, with an impressed line above it; body whorl with an impressed revolving line above and four raised revolving lines inferiorly; upper sinus of labrum deep and rounded, lower obsolete.

Locality. Virginia.

3. *Drillia arata*.—Turriculate, whorls 9; spire elevated, acute; subscalariform, the contracted portion of the whorls flattened and with perpendicular sides, below this space costate, ribs somewhat oblique and crossed by minute, close lines, which on the body whorl reach the base, obsolete above, distinct inferiorly.

Locality. Virginia.

4. *Drillia bella*.—Turriculate; whorls 7, scalariform, costate nearly to the suture; ribs distant, obtuse; whole surface with minute revolving raised lines, very minute and close on the contracted space below the suture, reflected labrum callous at the upper end.

Locality. Virginia.

5. *Drillia eburna*.—Turritid; upper part of whorl without ribs and with an impressed revolving line; lower part ribbed, ribs oblique, rounded; surface striated with close impressed revolving lines, finer and obsolete on the upper part of the whorls.

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MANGELIA*, Leach.

Mangelia Virginia n a.—Short-fusiform; whorls 5, subscalariform, or medially angular; ribs prominent, two whorls from the apex smooth; minute revolving lines on the lower half of the penultimate whorl; one or two obsolete revolving lines on the body whorl.

Locality. Yorktown, Virginia.

PETRICOLIDÆ.

PLEIORYTIS, Conrad.

Equivalve, ovate or oval, with radiating striæ, gaping posteriorly; hinge of right valve with two widely diverging teeth; left valve with one direct thick triangular, bifid tooth under the apex, and an oblique compressed tooth posteriorly; sinus of pallial impression extending beyond the middle of the valves; muscular impressions large. (Miocene.)

P. ovata.—Ovate, compressed, very inequilateral, thin, radiately striate, striæ numerous, undulate or irregular, crossed by wrinkled fine lines; cardinal teeth prominent.

Proportionally longer, more compressed and inequilateral than *P. centennaria*, and with narrower hinge teeth.

Locality. Day's Point, James River, Virginia.

FASCIOLARIIDÆ.

BUSYCON, Boltzen.

1. *B. carinatum*.—Fusiform; whorls 6; spire elevated; whorls angular, angle situated below the middle of the whorls, carinated, carina tuberculated, sides of volutions above the angle straight and very oblique, surface transversely striated; lines rugose, unequal, obsolete on the middle of last whorl; columella and canal sinuous.

Locality. Virginia.

2. *B. filosum*.—Pyriform, thick, lineated, lines revolving, close, fine, unequal, rugose; spire short, scalariform, spinose on the angle, spines foliated; columella twisted, sinuous; last whorl obliquely ridged; canal long, sinuous.

Locality. Yorktown, Virginia.

Resembles *B. gibbosum*, C., (Kiener, *Conch.* pl. 9, fig. 2.) but has shorter spines, finer striæ and more scalariform spire. That is a recent reversed species, but the fossil has been found dextral only. Rather common at Yorktown. The spire in some specimens is short and hardly scalariform, but the revolving ridge on the lower part of the body whorl distinguishes this from the other Miocene species.

FASCIOLARIA, Lam.

Subgenus LIROSOMA, Conrad. 1862.

Subpyriform; ribbed, beak narrow and produced, slightly recurved: one long, very oblique plait at the angle of the columella.

Fasciolaria (Fusus) sulcosa, Conrad, *Foss. Med. Tert.*

Subgenus TEREBRASPIRA, Conrad. 1862.

Spire elongated, whorls angular; plaits concealed or not reaching the outer edge of columella.

Fasciolaria elegans, Emmons, *Geol. N. C.*

BUCCINIDÆ.

TRITIA, Risso.

T. scalaris.—Ovate-acute; spire elevated, turritid; whorls 7, longi-
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tudinally ribbed; ribs rounded, prominent, curved on the last whorl; revolving lines close and distinct; right lip striated within; fold at base of columella distinct.

Locality.

BULLIA, Gray.

Subgenus BULLIOPSIS, Conrad.

1. *B. ovata*.—Smooth; last whorl subquadrate; ovate or oblong-ovate, entire; whorls 5 or 6, slightly convex; spire conical, about half the length of the shell; aperture elliptical.

Locality. St. Mary's Co., Md.

Shorter and broader than the other two species of Maryland, the callus not prominent nor extending beyond the upper extremity of aperture.

2. *B. Marylandica*.—Oblong-ovate, entire; whorls 6, slightly convex or subtruncated laterally; suture impressed; aperture about half the length of the shell; columella profoundly callous above, the callus extending beyond the lip.

Locality. St. Mary's Co., Md.

Proportionally longer than the preceding, and the spire subscalariform. The shell is variable in outline, the spire being much longer in some specimens than others of equal breadth.

3. *B. quadrata*, C., Journ. A. N. S. vi. 226.

There are no known living representatives of this subgenus.

COLUMBELLINÆ.

AMYCLA, H. and A. Adams.

Subgenus ASTYRIS, H. and A. Adams.

1. *Amycla communis*.—Ovate, whorls 6 or 7, smooth and polished; spire rather elevated; body whorl abruptly rounded in the middle or subangular; submargin of labrum minutely dentate.

Locality. St. Mary's River, Md.

A common species in the blue clay of Maryland and Virginia.

2. *A. avara*, var. *granulifera*.—Narrow-acuminate; longitudinally ribbed; ribs numerous, angular; spire subturriculate; whorls 8, crossed by impressed lines, four in number, on 4 whorls of the spire, and covering the body whorl to the base; where the lines cross the ribs there is a small tubercle; labrum 7-dentate within; columella subplicated from base to submedial angle.

Locality. Occurs with the preceding.

3. *A. reticulata*.—Subturritid; volutions 6—7, slightly convex; lines prominent, revolving and transverse lines equal in size, transverse lines most remote, lines smaller and closer below the middle of last whorl; right lip toothed within.

Locality. Virginia.

OLIVINÆ.

DACTYLUS, Klein.

Subgenus STREPHONA, Browne.

Dactylus eborus.—Slightly tumid on the upper part of body whorl; whorls 6 in number, the penultimate contracted below the suture; columella slightly tumid, with numerous acute plaits, and five oblique plaits at base, four of them elongated.

Locality. Virginia.

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DENTALIDÆ.

DENTALIUM.

D. Carolinense.—Regularly curved, ribs 9 to 11, narrow and laterally flattened.

Locality. North Carolina.

Larger, less tapering, and having fewer ribs than *D. attenuatum*, Say. Longer and tapering more than *D. ———*, Emmons, Geol. N. C., fig. 188.

VERMETIDÆ.

VERMETUS, Adams.

Subquadrate, ribs 3, longitudinal, distant, the lowest one most prominent; longitudinal lines minute, close, rugose, becoming obsolete near the spire, which is regular, each whorl having two carinated lines revolving in the middle and one joining the suture at base; longitudinal lines none.

Locality. Neuse River, below Newbern, N. C.

TROCHIDÆ.

LEIOTROCHUS, Conrad.

L. distans.—Trochiform; volutions 4; suture subcanaliculate near the apex; revolving lines, a few distant, distinct, impressed, the others very fine; periphery rounded; base convex-depressed, with six distant impressed revolving lines and very fine intermediate lines; umbilicus narrow, profound; subcarinated at base.

Locality. Calvert Co., Md. ?

CARINORBIS, Conrad.

Suborbicular; spire small, depressed, or but little prominent; shell costate, ribs revolving, distant, prominent; last whorl flattened above; umbilicus small, and the space beneath it channelled; peritome continuous.

C. (Delphinula) lyra, Conrad. *C. (Delph.) quadricostata*, Emmons. (Miocene.)

SCROBICULARIDÆ.

ABRA, Leach.

A. ovalis.—Oval, convex, inequilateral, with five close laminar concentric lines; posterior side short, with a distinct obtuse fold; end margins rounded; within highly polished; cardinal and lateral teeth prominent.

Locality. Yorktown, Virginia. (Miocene.)

ASTARTIDÆ.

ASTARTE, Sowerby.

Astarte distans.—Triangular, convex-depressed, with four broad concentric undulations; concentric lines unequal; umbo flattened with small prominent concentric ribs, inner margin minutely crenulated.

Locality. Cumberland Co., N. J., near Shiloh. (Miocene.)

Very distinct from the nearest allied species, *A. undulata* Say.

PARASTARTE, C.

Elevated, triangular, equilateral, ventricose; epidermis pale and shining; hinge of right valve with one thick nearly direct tooth, and deep and rather long channel in the hinge plate anterior to the tooth; left valve with two equally diverging teeth; posterior submargin of both valves channelled above.

Estarte triquetra, C., Tampa Bay, is the type of this new genus,

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which differs essentially from *Erycinelli*, whilst the exterior is very much like the latter. (Recent.)

CRASSATELLA, Lam.

C. producta.—Trapezoidal, elongated, inequilateral, concentrically ribbed; ribs or ridges subacute, prominent as far as the umbonal slope which is obtusely subcarinated, and curved inwards; posterior slope depressed and medially subangular, concentric lines not prominent except behind the umbo, where they are more distinct; posterior extremity obliquely truncated; inner margin minutely crenulated.

Locality. Enterprise, Clark Co., Miss. (Eocene.)

This elegant species may be distinguished from *C. protexta* by the furrows or ridges extending over the whole disk. It belongs to a group of fossils quite distinct from those of Claiborne, Jackson or Vicksburg.

TRIGONIIDÆ.

VERTICORDIA, Wood.

V. Emmonsii, C., Emmons, Geol. N. C., 286 206.

This is the only species yet known in an American formation.

ARCIDÆ.

CUCULLÆA, Lam.

The typical form of hinge teeth in this genus is not represented in the Eocene or Cretaceous *Arcidæ*. The oldest form which could be referred to *Cucullæa* occurs in the latter formation, represented by thick ponderous shells, with a broad hinge, and are in marked contrast to that of the recent species, whilst the character of the teeth is equally remote. I propose, therefore, to characterize the cretaceous subgenus as follows:

IDONEARCA, Conrad.

Triangular, thick, delicately lined; hinge thick, medial cardinal plates transverse, laminar, laterally striated; anterior and posterior plaits elongated, oblique, curved downwards at the ends towards the umbo, and laterally striated; interior plate curved, very prominent.

Cucullæa Tippiana, C., and *T. capax*, C. (Cretaceous.)

The following European species will come under this section:

Arca tumida, d'Orbig., *A. Marceana*, d'Orbig., *A. fibrosa*, d'Orbig.

TRIGONARCA, Conrad.

Equivalve, trigonal, angular on the umbonal slope; hinge area narrow; series of cardinal plates curved and placed transversely or nearly at right angles to the hinge line.

T. (Cucullæa) Maconensis, C., Journ. A. N. S.

Viewed exteriorly, this shell has the habit of *Cucullæa*, but the hinge of *Axinaea*. It probably has the internal elevated plate, but the specimens are filled with stone too hard to be removed, (Cretaceous.)

Subgenus LATIARCA, Conrad.

Triangular, thick, capacious; hinge line narrow medially, broad and thick on the sides; cardinal plates granular and laterally striated, towards the ends in short oblique series; cardinal area wide with obliquely diverging grooves.

L. (Cucullæa) gigantea, C., *L. idonea*, C., *C. ononchela*, Rogers, *C. transversa*, Rogers. (Eocene.)

ANOMOLOCARDIA, Klein.

A. trigintinaria.—Elongated, rhomboidal, very unequilateral, ven-
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tricose; ribs about 31; square, not very prominent, on the posterior side divided by an impressed line and posterior to the umbo with an intermediate raised line; posterior end emarginate; cardinal area transversely striated; hinge line long, and the plates numerous; disk medially contracted or flattened; interstices of the ribs transversely striated.

Locality. South Carolina. (Miocene.)

NOETIA Gray.

N. ponderosa, Say, var. *N. carolinensis*.—Ovato-cuneate, ventricose; disks flattened submedially, ribs about 35 in number; narrow, flattened, divided by an impressed line, except on the anterior side, where they are distinctly lined only near the base, transverse wrinkles between the ribs close and prominent; these intercostal spaces have each an acute radiating line about the umbonal slope and posteriorly; basal margin slightly contracted medially.

Locality. Dauphin Co., North Carolina. (Miocene.)

Compared to the typical *ponderosa* it is less ventricose, proportionally longer, and has 35 ribs, whilst the latter has only 26.

N. ponderosa, Say, is abundant in a fossil state in some localities, and Mr. Tryon has obtained specimens from Cape May, in company with *Turritella plebeia*, Say, but I have not seen a recent specimen, and suppose it to be an extinct species.

STRIARCA, Conrad.

Equivalve, radiately striate, closed; hinge area transversely striated, and also the epidermis above it; hinge line dilated and curved at the ends; teeth divided into oblique hollow cross plaits.

S. (Arca) centenaria, Say. (Miocene.)

The remarkable teeth of this genus distinguish it from all other genera of *Arcidæ*; the plaits are hollow with parallel laminar sides.

BARBATIA, Gray.

Subgenus GRANOARCA, Conrad.

Equivalve, gaping anteriorly; hinges are rather wide and very oblique, with longitudinal grooves angulated under the back; tooth more or less divided into granular plates, posteriorly widely expanded and broken into irregular granules.

A. propatula, C. Miocene Foss., 61, 32, 1.

CARDITIDÆ.

Subgenus PTEROMERIS, Conrad.

Triangular, not oblique, with radiating ribs; beaks medial; hinge of left valve. anterior tooth direct or directed slightly towards the anterior margin; posterior tooth double or bifid.

Cardita perplana, C.—A fossil of the North American Miocene is the type of this genus, which embraces two fossil and one recent species, all small shells. The other fossil species is *Cardita abbreviata*, C., and the recent *P. (Astarte) flabella*, C., of Florida.

Family MYTILIDÆ.

MYTILOCONCHA, Conrad.

Subfalcate, thick; perlaceous, laminated; hinge thick, elongated; pointed at the apex; an oblique tooth or ridge and parallel furrow throughout the entire length of hinge area.

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1. *M. (Myoconcha) incurva*, C., Miocene, Foss. 52, 28, 1.
2. *M. (Mytilus) incrassata*, C., *ib.*, 74, 42, 4.

PECTENIDÆ.

PECTEN, Lin.

P. fraternus.—Ovate, upper valve slightly ventricose, lower convex depressed; ribs 15 or 16, prominent; convex, laterally flattened, narrower than the interstices, trilineate, squamose; interstices with fine, unequal, delicately squamose radiating lines; lower valve, ribs broader, and more numerous lined; ears moderate, with radiating numerous rugose lines.

Locality. Virginia. (Miocene.)

Differs from *P. Jeffersonius* in being comparatively more elevated or ovate; in having smaller ears, and more numerous and narrower ribs, &c.

P. Edgemoensis.—Suborbicular; height not quite equal to the length; lower valve-ribs 16 to 17, prominent, but not elevated, square or convex-depressed, not quite as wide as the intervening spaces, radiately lined with finely squamose striæ, most conspicuous towards the margins, interstices of ribs carinated, in the middle squamose and finely striated; ears with fine close unequal squamose radiating lines, the larger ones most prominent on the posterior side; margins of ligament pit carinated.

Locality. Edgewood Co., North Carolina. Cab. Smithsonian Institution.

Allied to *P. boreus*; the carina between the ribs distinguish it from that species. (Miocene.)

LYROPECTEN, Conrad.

Inequivalve, radiately costate; hinge with a triangular pit as in *Pecten* and diverging prominent teeth on each side the ligament cavity.

Lyropectin (Pallium) estrellanus, C., Pacific R. R. Reports, 1855, vi. pl. 3, f. 15.

This genus is peculiar to the Miocene of the Pacific slope, and appears in three large species, the second of which has been figured and described as *Pallium estrellanum*, in Pacific Railroad Reports, vol. vii. 191, but is very distinct from that species. I propose to name it *Voleformis*.

L. crassicardo.—Suborbicular; ribs 15; larger valve ventricose; ribs rounded, not quite as wide as intervening spaces; whole surface radiately striate with equal lines, about 11 on the ribs and 5 on the interstices; opposite valve convex, ribs prominent, narrower and more abrupt than in the large valve, disposed to be concentrically nodulous or undulated by broad concentric furrows, and sometimes an abrupt concentric truncation.

Locality. California.

OSTRIADÆ.

OSTREA, Lin.

O. falciformis.—Falcate, radiately ribbed; ribs numerous, regular, close, rounded, crossed by squamous lines; ribs small on the anterior depression; margins plicated, not crenulated; ligament cavity oblique.

Locality. Enterprise, Clark Co., Miss. Dr. Spillman. (Eocene.)

Revision of the GULLS of North America; based upon specimens in the
Museum of the Smithsonian Institution.

BY ELLIOTT COUES.

The present paper is an abstract of a more extended Monograph on the Gulls of North America, prepared for publication in a Government Report. 1862.]